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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ronald Kakoschke

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EXAMINER

SALERNO, SARAH KATE

ART UNIT

PAPER NUMBER

2814

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/521,528	Applicant(s) KAKOSCHKE ET AL.	
	Examiner SARAH K. SALERNO	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-10 and 13-28 is/are pending in the application.
- 4a) Of the above claim(s) 13-19,21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-10,20 and 23-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/27/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment/arguments filed on 03/27/09 as being acknowledged and entered. By this amendment claims 7, 11-12 are canceled, no new claims have been added, claims 1-6, 8-10 and 13-28 are pending and claims 13-19 and 21-22 are withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 9 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hueting et al. (WO/01/69684 A2 of record) in view of Nakamura. (JP 2000-049245).

Claim 1: Hueting teaches a field-effect transistor comprising: a doped channel region (15) arranged along a first depression (20), a doped first terminal region (13) near an opening of the first depression, a second doped terminal region (14) remote from the opening, the second terminal comprising a connecting region (41) extending up from a portion of the second terminal approximately as far as a surface containing the opening or being electrically conductively connected to an electrically conductive connection leading to the surface.

a control region (11) arranged in the first depression, an electrical insulating region (22) between the control region (11) and the channel region (15), and a second depression (23) between the first terminal region and the connecting region,

the field-effect transistor comprising only one depression in which the control region is arranged (FIG. 1-2)

Hueting does not teach the field-effect transistor being a drive transistor at a word line or at a bit line of a memory cell array. Nakumura teaches a field-effect transistor being a drive transistor at a word line or at a bit line of a memory cell array as is known in the art to use (Abs). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transistor taught by Hueting and use it as a drive transistor at a word line or at a bit line of a memory cell array as is a common function of transistors as taught by Nakumura

Claim 2: Hueting teaches the first and second terminal regions comprise substantially the same dopant concentration and dopants of the same conduction type (pg 4 lines 24-25 & pg 7 lines 15-17).

Claim 3: Hueting teaches the channel region (15) comprises a length corresponding to at least two thirds of a depth of the first depression (FIG. 1).

Claim 4: Hueting teaches the first depression is a trench or a hole (Page 4 line 28).

Claim 5: Hueting teaches the channel region lies on opposing sides of the trench (FIG. 1).

Claim 6: Hueting teaches the channel region lies only along part of a periphery of the hole (FIG. 1).

Claim 8: Hueting teaches the first depression for the control region and a third depression (24) filled with an electrical insulating material between the field-effect transistor and an adjacent electrical component have the same depth (FIG. 1).

Claim 10: Hueting teaches wherein the electrical insulating region has an insulating thickness of at least 15 nm (page 7 lines 18-20).

Claim 20: Hueting teaches the distance between the first and second terminal regions along the first depression is at least 0.4 μm (Page 7 lines 15-25).

Claim 23: Hueting teaches at least one terminal region has a shallow doping profile gradient which permits a switching voltage having a magnitude of greater than 9 volts but less than 30 volts (Page 5 Col. 25-33, Page 7 lines 15-25).

Claim 24: Hueting teaches wherein the first depression comprises a width of approximately 150nm (Page 7).

Claim 26: Hueting teaches wherein the first depression comprises a depth of approximately 1 μm (Page 7 lines 15-25).

Claim 27: Hueting teaches wherein the first and second terminal regions each comprise a top side and a bottom side wherein the bottom side of the first terminal region faces the top side of the second terminal region and wherein a distance between the top side of the first terminal region and middle portion of the second terminal region is approximately 1 μm (Page 7 lines 15-25).

Claim 28: Hueting teaches wherein the first depression extends from the opening to approximately half-way through the second terminal region (FIG. 4).

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4. Claims 9 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hueting et al. (WO/01/69684 A2 of record) and Nakamura. (JP 2000-049245), as applied to claim 1 above, and further in view of Degawa et al. (EP 0872895 of record).

Regarding claim 9, as described above, Hueting and Nakamura substantially read on the invention as claimed, except Hueting and Nakamura do not teach the first depression for the control region has a smaller depth than a third depression filled with an electrical insulating material between the field-effect transistor and an adjacent electronic component. Degawa teaches the first depression for the control region (14) has a smaller depth than a third depression filled with an electrical insulating (12) material between the field-effect transistor and an adjacent electronic component to stabilize performance (Col. 2 lines 5-10). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Hueting and Nakamura to have the first depression for the control region has a smaller depth than a third depression filled with an electrical insulating material between the field-effect transistor and an adjacent electronic component to stabilize performance as taught by Dagawa (Col. 2 lines 5-10).

Claim 25: Degawa teaches wherein a width of a first depression is approximately equal to a width of the second depression (FIG. 1).

Response to Arguments

5. Applicant's arguments with respect to claims 1-6, 8-10, 20 and 23-28 regarding the teaching of the transistor being a drive transistor at a word line or at a bit line of a memory cell array have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments filed 03/27/09 have been fully considered but they are not persuasive. Applicant argues that Hueting does not teach the claim limitation "only one depression in which the control region is arranged". Applicant's arguments are not persuasive because as seen in Hueting's figure 2, trench 20 is a single depression in which the control region is arranged.

Conclusion

7. Applicant's amendments on 10/23/08 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 03/27/09 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH K. SALERNO whose telephone number is (571)270-1266. The examiner can normally be reached on M-R 8:00-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wael M Fahmy/
Supervisory Patent Examiner, Art
Unit 2814

/S. K. S./
Examiner, Art Unit 2814